WHAT IS CLAIMED IS:

A method for making mixed-metal particles, comprising:

preparing a solution selected from the group consisting of a solution comprising two or more dissolved metals and/or metal-containing compounds comprising metals selected from Group IIB, a solution comprising two or more dissolved metals and/or metal-containing compounds comprising at least one each metal selected from Groups IB and IIIB, and a solution comprising two or more dissolved metals and/or metal-containing compounds comprising at least one each metal selected from Groups IIIB and IVB;

forming droplets of the solution; and

heating the droplets to pyrolyze the contents of the droplets to form mixed-metal particles.

- 2. A method according to claim 1, wherein the mixed-metal particles are a single-phase metal oxide.
- 3. A method according to claim 1, wherein the mixed-metal particles comprise multiple metal oxide phases.
- 4. A method according to claim 1, wherein the mixed-metal particles comprise a metal oxide phase and a non-oxide phase.
- 5. A method according to claim 1, wherein the mixed-metal particles are multinary metallic particles.
- 6. A method according to claim 1, wherein the mixed-metal particles comprise at least one phase substantially enveloping at least one other phase
- 7. A method according to claim 1, wherein the particles comprise Cu and In and have an average diameter of less than about 1 micron.
 - 8. A method according to claim 1, wherein the particles comprise Cu, In and Ga.

- 9. A process for making a mixed-metal compound material, comprising: reacting (a) a precursor material comprising multi-phase, mixed-metal particles comprising a metal oxide phase, with (b) at least one reactant material, to form a mixed-metal compound material.
- 10. A process according to claim 9, wherein the multi-phase, mixed-metal particles comprise multiple metal oxide phases.
- 11. A process according to claim 9, wherein the multi-phase, mixed-metal particles comprise at least one phase substantially enveloping at least one other phase.
- 12. A process according to claim 9, wherein the precursor material comprises multi-phase particulate materials and other particulate materials.
- 13. A process according to claim 9, wherein the reactant materials are present as particles admixed with the precursor material or as layers overcoated on to the precursor material.
- 14. A process according to claim 9, wherein the mixed-metal compound material is a Group VB or VIB compound material and wherein at least one of the reactant materials comprises one or more Group VB or VIB elements.
- 15. A process according to claim 9, wherein the particles comprise one or more elements from Groups IB and/or IIIB.
- 16. A process for making a mixed-metal compound material, comprising: reacting (a) a precursor material comprising multi-phase, mixed-metal particles comprising a metal oxide phase and a non-oxide phase, with (b) at least one reactant material, to form a mixed-metal compound material.
 - 17. A process according to claim 16, wherein the non-oxide phase comprises a

metal phase.

- 18. A process according to claim 16, wherein the non-oxide phase is a non-oxide chalcogenide compound.
- 19. A process according to claim 16, wherein the multi-phase, mixed-metal particles comprise at least one phase substantially enveloping at least one other phase.
- 20. A process according to claim 16, wherein the precursor material comprises other particulate materials in addition to the multi-phase, mixed-metal, particulate materials.
- 21. A process according to claim 16, wherein the precursor material is deposited as one or more layers on a substrate.
- 22. A process according to claim 16, wherein the reactant materials are present as particles admixed with the precursor material or as layers overcoated on the precursor material.
- 23. A process according to claim 16, wherein the mixed-metal compound material is a Group VB or VIB compound material and wherein at least one of the reactant materials comprises one or more Group VB or VIB elements.
- 24. A process according to claim 16, wherein the particles comprise one or more elements from Groups IB and/or IIIB.